NCAR

Societal Impacts Program

Jeffrey K. Lazo

USWRP Workshop – Boulder, CO

May 4, 2010

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USWRP

Societal Impacts Program

Overview:

- **funded by NCAR / NOAA's USWRP / external grants**
- **initiated April 1, 2004**

Staffing

- **~3 FTE** *(keep this in mind as I discuss what we are doing in the following slides)*

Objective:

- **infuse social science and economic research, methods, and capabilities into the planning, execution, and analysis of weather information, applications, and research directions through:**
    1. Primary Research
    2. Weather and Society * Integrated Studies (WAS*IS)
    3. Information Resources
    4. Develop and Support Weather Impacts Community

1 - Primary Research – Internal Funding

- **Overall US Sector Sensitivity Assessment**
  - *BAMS* – under review
  - Plan to develop Individual Sector Studies

- **Household Survey**
  - Communicating Uncertainty – *Weather and Forecasting* – October 2008
  - 300 Billion Served: Sources, perceptions, uses, and values – *BAMS* – May '09
  - Analysis of Decision Making – *Meteorological Applications* - forthcoming
  - Geospatial Analysis – *Weather, Climate, and Society* – under review
  - Cross-analysis on with weather saliency – possibly Summer 2010
  - Basis for future work . . .

- **Hurricane Household Valuation**
  - *Weather and Forecasting* – February 2010
  - *Economics Letters* – forthcoming
  - Basis for HFIP, Storm Surge, WDEWE surveys . . .

- **Storm Data**
  - to be submitted to *Natural Hazards Review* – summer 2010

1 - Primary Research - External Funding

- Communication of Forecast Uncertainty: Broadcasters – *BAMS* Nov. '09

- Hurricane Forecast Improvement Project (*NOAA*)
  - EM interviews complete
  - Focus groups week of May 24
  - Completion expected by end of 2010

- Communicating Hurricane Information (*NSF/NOAA*)
  - Miami data collection complete
  - Houston data collection this summer

- Warning Decisions: Extreme Weather Events (*NSF*)
  - Boulder data collection complete
  - Boulder – public survey (507 respondents)
  - Miami data collection – this week

- Forecast at a Glance (*NWS*)
  - Initial focus groups complete

- Storm Surge Warning Product (*NWS)*
  - Kickoff meeting yesterday (Monday May 3rd)

2 - Weather and Society Integrated Studies (*WAS*IS*)

Overview

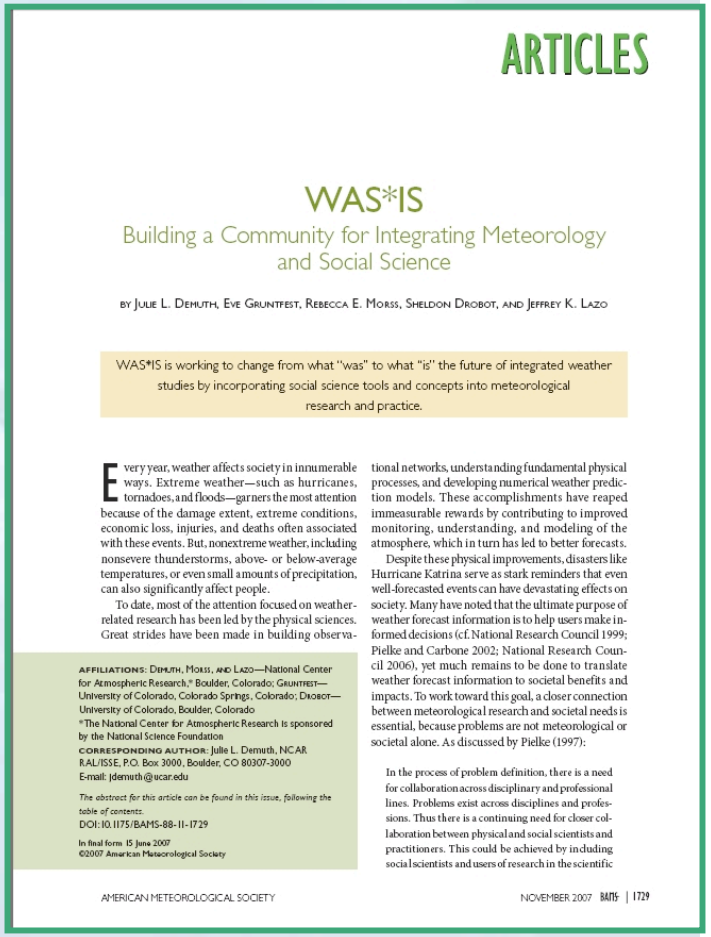
- Capacity building – NOT research

- 7 workshops - 198 participants
  - 5 in Boulder
  - Australia
  - Norman, OK

- Future Workshops
  - Caribbean – June 2010
  - Boulder – August 2010
  - Caribbean – Spring 2011
  - Boulder – Summer 2011

Outcomes

- Demuth, et . al. 2007. "Building a Community for Integrating Meteorology and Social Science" *BAMS*
- WAS*IS Compendium
- NWS Workshop – Kansas City - October 2007
- **Integrated Warning Teams**



ARTICLES

WAS*IS
Building a Community for Integrating Meteorology and Social Science

BY JULIE L. DEMUTH, EVE GRUNTFEST, REBECCA E. MORSS, SHELDON DROBOT, AND JEFFREY K. LAZO

WAS*IS is working to change from what "was" to what "is" the future of integrated weather studies by incorporating social science tools and concepts into meteorological research and practice.

Every year, weather affects society in innumerable ways. Extreme weather—such as hurricanes, tornadoes, and floods—garners the most attention because of the damage extent, extreme conditions, economic loss, injuries, and deaths often associated with these events. But, nonextreme weather, including nonsevere thunderstorms, above- or below-average temperatures, or even small amounts of precipitation, can also significantly affect people.

To date, most of the attention focused on weather-related research has been led by the physical sciences. Great strides have been made in building observational networks, understanding fundamental physical processes, and developing numerical weather prediction models. These accomplishments have reaped immeasurable rewards by contributing to improved monitoring, understanding, and modeling of the atmosphere, which in turn has led to better forecasts.

Despite these physical improvements, disasters like Hurricane Katrina serve as stark reminders that even well-forecasted events can have devastating effects on society. Many have noted that the ultimate purpose of weather forecast information is to help users make informed decisions (cf. National Research Council 1999; Pielke and Carbone 2002; National Research Council 2006), yet much remains to be done to translate weather forecast information to societal benefits and impacts. To work toward this goal, a closer connection between meteorological research and societal needs is essential, because problems are not meteorological or societal alone. As discussed by Pielke (1997):

> In the process of problem definition, there is a need for collaboration across disciplinary and professional lines. Problems exist across disciplines and professions. Thus there is a continuing need for closer collaboration between physical and social scientists and practitioners. This could be achieved by including social scientists and users of research in the scientific

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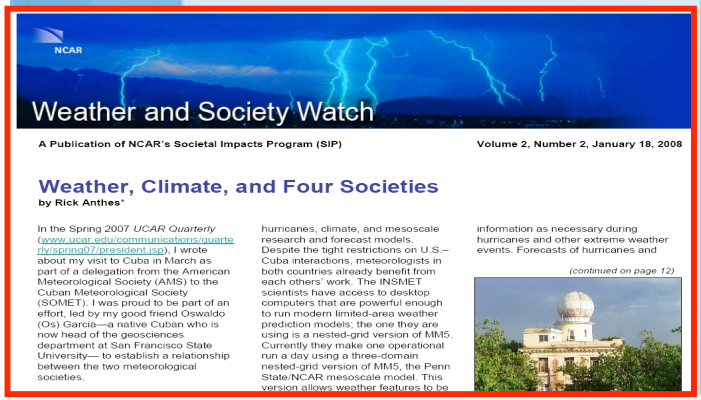
3 - Information Resources

- **Extreme Weather Sourcebook – updated to 2007**
  - $17.7B / year weather damages (1955-2006)
  - Storm Data research project
- ***Weather and Society Watch***
  - 300+ subscribers
  - Quarterly newsletter – including special issue for AMS mtg.
- **Societal Impacts Program Discussion Board**
  - 250+ participants
- **Digital Library – Literature Database**
  - Under development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Weather and Society Watch

A Publication of NCAR's Societal Impacts Program (SIP) Volume 2, Number 2, January 18, 2008

Weather, Climate, and Four Societies

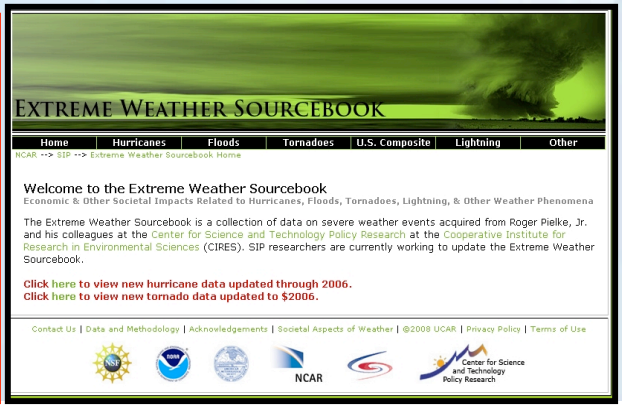
by Rick Anthes*

In the Spring 2007 *UCAR Quarterly* (www.ucar.edu/communications/quarterly/spring07/president.jsp), I wrote about my visit to Cuba in March as part of a delegation from the American Meteorological Society (AMS) to the Cuban Meteorological Society (SOMET). I was proud to be part of an effort, led by my good friend Oswaldo (Os) Garcia—a native Cuban who is now head of the geosciences department at San Francisco State University— to establish a relationship between the two meteorological societies.

hurricanes, climate, and mesoscale research and forecast models. Despite the tight restrictions on U.S.–Cuba interactions, meteorologists in both countries already benefit from each others' work. The INSMET scientists have access to desktop computers that are powerful enough to run modern limited-area weather prediction models; the one they are using is a nested-grid version of MM5. Currently they make one operational run a day using a three-domain nested-grid version of MM5, the Penn State/NCAR mesoscale model. This version allows weather features to be

information as necessary during hurricanes and other extreme weather events. Forecasts of hurricanes and

(continued on page 12)



4 – Community Development and Support

- **NOAA**
  - HIC-MIC Meeting – April 20010
  - NOAA SAB EISWG (ongoing)
  - Customer Satisfaction Survey
  - ESRL-NCAR Seminar Series (2008-09)
  - Hurricane Forecast Socio-Economic WG
  - SAFER Workshop – May 2010
  - Multiple other activities . . .
- **AMS**
  - Board on Societal Impacts
  - Editor - *Weather, Climate, and Society*
  - Area Editor – *BAMS*
- **NRC**
  - USWRP Summer Workshop - 2009
  - Multifunction Phased Array Radar
- **WMO**
  - WWRP Social and Economic Research and Applications Working Group
  - Public Weather Service Task Force
  - International Workshop on the Assessment of Socio-economic Benefits of Meteorological and Hydrological Services
- **Other . . .**
  - National Weather Association
  - National Hurricane Conference
  - Interdepartmental Hurricane Conference

SOCIETAL AND ECONOMIC RESEARCH AND APPLICATIONS FOR WEATHER FORECASTS

Priorities for the North American Thorpex Program

BY REBECCA E. MORSS, JEFFREY K. LAZO, BARBARA G. BROWN, HAROLD E. BROOKS, PHILIP T. GANDERTON, AND BRIAN N. MILLS

Societal and economic research and applications can significantly improve understanding of weather–society interactions, benefiting the meteorological community and society.

Hazardous weather-related events cause thousands of deaths and billions of U.S. dollars in damage each year worldwide.[1] Weather also affects many socioeconomic activities, ranging from agriculture to transportation to water resource management. Because of weather's significant effects on society and the economy, decision makers have grown to rely on weather forecasts provided by the meteorological community. Yet significant gaps remain among the weather forecast information available, its use in decisions, and desired societal outcomes such as reduced deaths, reduced damage, and enhanced well-being. These gaps between weather forecasts and their societal benefits can be illustrated by numerous examples, ranging from high-profile cases—such as the 2003 European heat wave and 2005's Hurricane Katrina—to experience with forecasts and outcomes in local weather events. Related gaps are evident in areas such as flood prediction, seasonal climate prediction, and climate change (e.g., Pielke 1999; Sarewitz et al. 2000; Lemos et al. 2002). As these examples indicate, one cannot, a priori, assume that forecasts will be useful and valuable without considering how they interact with societal decisions and outcomes. In order to enhance weather forecast use and help realize the potential value

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[1] From www.wmo.int/pages/madrid07/, compiled from S. G. Cornford reviews in WMO Bulletin, 1998–2003. Related statistics for the United States can be found in NRC (1998) and Pielke and Carbone (2002).

AMERICAN METEOROLOGICAL SOCIETY

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SIP Overview

- **2009 accomplishments**
- **2010 activities and intended outcomes**
- **Transition to operations**
- **Successes**
- **Issues**
  - Status as a “testbed”
  - 2010 – short staffed Q1 & Q2
  - Budget cuts hand-in-hand with statement that “this is important work”
  - Multiple, unclear, or conflicting expectations
  - Significant potential for value added
    - Economic studies – generation of value and program justification
    - Understanding of and improved communication of forecasts – especially wrt uncertainty
    - Understanding decision making and use of forecast information
    - Collaboration on user-relevant verification